## Storage Tanks for Helium Gas in B902

- The storage tanks for helium gas in B902 consists for clean and dirty (not pure sufficiently for liquefaction) helium.
- In addition there are a few buffer tanks for cryogenic operation.
- There are 4 groups of tanks used for clean storage.
- There are 2 groups of tanks used for dirty storage.
- Photo of the gas storage tanks and associated relief valves are given later in this file.
- Dimension and storage capacity are given next.



## Storage Tanks for Clean Helium

- There are 4 groups of tanks for clean storage as show below.

| | Dia. in | Wall in (est). | Length ft (est) | Vol CF |
|---|---|---|---|---|
| **Clean Storage** | | | | |
| **Clean tank 1** | 84 | 0.6 | 45 | 1604 |
| **Clean tank 2** | 96 | 0.6 | 45 | 2005 |
| **Tube B #1** | 24 | 0.25 | 80 | 241 |
| **Tube B #2** | 50 | 0.5 | 45 | 589 |

# Total Storage Capacity for Clean Helium

| Tank | No. | Volume each CF | Volume subtotal CF |
|---|---|---|---|
| **Clean** | **4** | **2005** | 8021 |
| | **1** | **1604** | 1604 |
| Tube B #1 | 33 | 241 | 7952 |
| Tube B #2 | 4 | 589 | 2357 |
| **Total** | | | **19935** |

At 225 psia pressure, these tanks are capable of storing ~ 300,000 standard cubic foot of helium (equivalent to 6 x 50,000 cubic foot trailers or ~ 11,000 L of liquid helium).

As June 7 2010, there is a plan to return one 2000 cubic foot tank to NSLS for the X17 cryogenic system. When that tank is removed, the total capacity will be reduced by ~ 10%.



# Storage Tanks for Dirty (Contaminated) He

- There are 2 groups of tanks for contaminated helium with 24" and 66" dia.
- These tanks are designed for 500 psi and are capable of storing ~ 90,00 SCF of helium.

| | No. | Dia. in | Wall in (est). | Length ft (est) | Vol CF | Vol. CF Sub-total | Pressure At psia | Vol. SCF Sub-total |
|---|---|---|---|---|---|---|---|---|
| **Dirty Storage** | | | | | | | | |
| **Tube #3** | 6 | 24 | 0.25 | 40 | 120 | 723 | 500 | 24096 |
| **Tube #4** | 2 | 66 | 1 | 45 | 1005 | 2011 | 500 | 67021 |
| **Total** | | | | | | **2734** | | **91117** |

# Photo of Storage Tanks



# 3 HP Clean He Storage Tanks
# Tank 1 – the smallest

# B902 Old HP Helium Storage (Left)

Upper 6 cylinders are for dirty storage and bottom 4 cylinders are for clean gas. These 4 clean storages have one Circle Seal relief valve, 5159 B-8-1500 J relief Valve. Flange for the 4 clean storages are 1500 lb standard, ASA B16.5, 1961. (O.D. 23", 12 1-7/8" bolts, ~ 5" thick > 4-1/4")



# B902 Old HP Helium Storage (Middle)

These two tanks are for dirty helium gas storage. One Circle Seal relief valve, K 5159 13-4MP-600, is shared by these two tanks and the 6 upper cylinders in the left of tank farm.

# Plate - B902 Old HP Helium Storage (Middle)


A plate stating 2800 psi MAWP and manufactured in 7/15/60.



# B902 Old HP Helium Storage (Right)


These 33 cylinders are for clean helium gas storage. Rated 600 psi, typically operating at 190 psi. One relief valve is installed for each 3 cylinders. Circle Seal 5159B, 2MP-300, Relief Valve. Range: 286 – 345 psi.

# Relief Valve - B902 Old HP Helium Storage (Right)

These 33 cylinders are for clean helium gas storage. Rated 600 psi, typically operating at 190 psi. One relief valve is installed for each 3 cylinders. Circle Seal 5159B, 2MP-300, Relief Valve. Range: 286 – 345 psi.



# 3 HP He Storage Tanks Tank 1 – the smallest

# HP He Storage Tank 1 – Relief Valve
set at 240 psig, 1054 SCFM

13

# Relief Valve - B902 Helium Storage
(Tank 2 – 5?)


14

# Relief Valve - B902 Helium Storage (Tank 2 – 5?)




# LP He Storage - Buffer Tank

# Relief Valve - B902 Helium Storage (Tank 6)



# LP He Storage (Red Tank)

# LP He Storage (Red Tank) – Relief V.

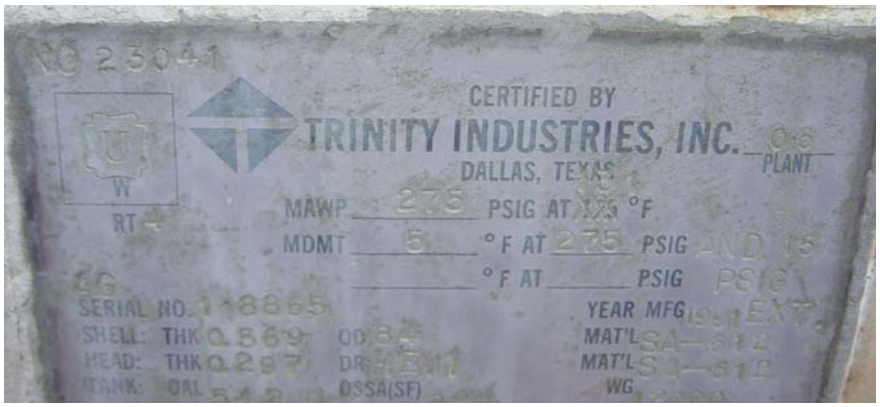


# Relief Valve and Rupture Disc at Inlet to B902 Warm Storage (Tank 8)

# 3 HP He Storage Tanks
# Tank 1 – the smallest



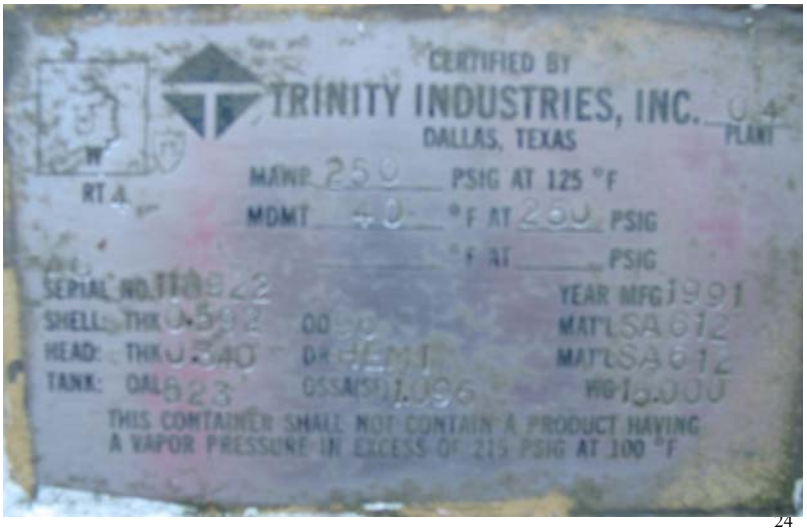
# HP He Storage Tank 1 – ASME Plate
# MAWP – 275 psig



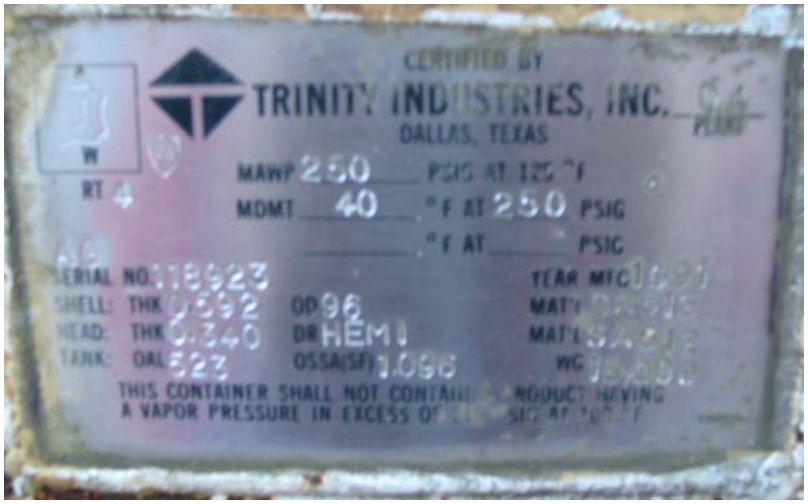
# HP He Storage Tank 1 – ASME Plate




# HP He Storage Tank 2 – ASME Plate

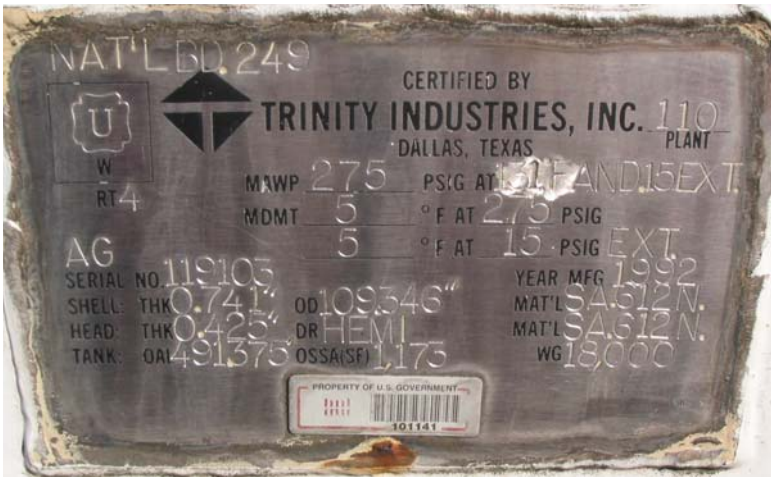


# HP He Storage Tank 3? – ASME Plate






# LP He Storage (Buffer Tank?) ASME Plate



# LP He Storage (Red Tank) – BNL Label